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Two major causes of morbidity in geriatrics: Cataract, knee osteoarthritis and patients' body awareness

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Abstract
Aim: Cataract and osteoarthritis are important diseases that cause morbidity in the geriatric population. Age is an important risk factor for both diseases. There is no clear information about the correlation of the severity of diseases yet.
Material and Methods: The cataract score for the right and left eyes and the osteoarthritis stage for the right and left knee of each patient were determined. After staging, body awareness questionnaire (BAQ) was administered to the patients to test their body awareness. In the study, the correlation of the patients' cataract scores and osteoarthritis stages was examined. In addition, relationships between the cataract score and the BAQ score and between the osteoarthritis stage and the BAQ score were analyzed.
Results: There was a significant correlation between patients' cataract scores and osteoarthritis stages, but this correlation was not strong. Cataract progression was found to be more asymmetrical than osteoarthritis. It was also found that the relationship between the cataract stage and body awareness was much stronger than the osteoarthritis stage.
Discussion:The diseases identified in this study have the potential to cause significant clinical and economic consequences when inadequately treated. Therefore, geriatric screening programs can provide a chance for treatment before diseases progress.

Keywords
Aging, Body Awareness Questionnaire, Cataract, Geriatrics, Osteoarthritis

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Introduction

Insufficient interest in health problems by elderly individuals has led to significant morbidity and mortality. It has become important to treat two common diseases, such as osteoarthritis and cataracts, in order to improve the quality of life of the geriatric population. Cataract is one of the leading causes of vision loss worldwide [1]. The prevalence of cataracts increases with the increase in the elderly and diabetic population [2]. Cataract surgery provides an effective visual gain in most cases [2]. A decrease in the level of vision and poor quality of vision can limit the daily life activities and social performance of the individual.

Osteoarthritis, a degenerative joint disease, is the most common joint disease in adults worldwide [3]. Joints, where osteoarthritis is commonly experienced, are the hands, hips, knees, and spine. The most commonly involved joint is the knee joint [4]. Osteoarthritis is progressive, and as a result of a prolonged lifespan, it becomes a cause of morbidity that affects the daily life of the individual and significantly impairs social performance.

The common risk factor for cataracts and osteoarthritis is age, and they remain an important public health problem with the increase in population and prolonged life expectancy [5,6]. They are frequently seen together at advanced ages, but there are not enough studies on the correlation of their stages with each other and the awareness of patients about their bodies. In our study, we examined the extent to which the stages of cataracts and osteoarthritis progressed together and the body awareness of the patients.

Material and Methods

This cross-sectional study was carried out by the departments of Orthopedics, Traumatology and Ophthalmology, Nigde Omer Halisdemir University Hospital. The study was approved by the Nigde Omer Halisdemir University Hospital Ethics Evaluation Committee (Date: 11.08.2022 Protocol No: 2022-83) and written consent was obtained from each patient before participating in the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

The study group consisted of patients who were followed up by the orthopedics department of our hospital with the diagnosis of knee osteoarthritis and were sent to ophthalmology clinic for an eye examination. A total of 848 patients were included in our study. Eyes and knees of each patient were included in the study. Patients with one eye or one knee were not included in the study. Patients with systemic disease and chronic drug use were excluded from the study. In addition, cases with cataracts and osteoarthritis secondary to trauma or surgery were excluded from the study. Patients with eye and knee joint diseases other than osteoarthritis and cataracts were not included in the study. Age, gender, and clinical information of all cases were recorded. A detailed medical history of all individuals was questioned. The stage of patients diagnosed with knee osteoarthritis according to the criteria of the American College of Rheumatology was determined according to Kellgren-Lawrence criteria in the anteroposterior and lateral radiographs of the knees [7]. The right and left knees were staged separately, and both knee stages were averaged, thus finding a mean knee osteoarthritis stage for each patient. Cataract severity was graded by a single observing physician based on the Lens Opacities Classification System III (LOCS III) score [8]. The nuclear opacity (NO) score was used as a reference to classify the cataract. The right and left eyes were staged separately, and both cataract scores were averaged to find a mean cataract score for each patient.

After staging, a questionnaire was administered to the patients to test their body awareness. The body awareness questionnaire (BAQ) was applied to the patients by face-to-face interview method [9]. Participants were asked to rate each statement with a score ranging from 1 (1: Not at all true) to 7 (7: Completely true), and the total score was obtained by summing the scores of each statement. The total score ranges from 18 to 126. The higher the total score, the higher the body awareness.

The study examined the relationships between right eye cataract scores and right knee osteoarthritis stages, left eye cataract scores and left knee osteoarthritis stages, and mean cataract scores and mean osteoarthritis stages. Correlations between right cataract scores, left cataract scores, mean cataract scores, and BAQ scores were analyzed. In addition, correlations between the right knee osteoarthritis stage, the left knee osteoarthritis stage, the mean osteoarthritis stage, and BAQ scores were analyzed.

Statistical analysis

Data processing and analysis were performed using the Statistical Package for Social Sciences (SPSS) software, version 25. Categorical data were presented as number (n) and percentage (%), while numerical variables were presented as mean and standard deviation. The Pearson correlation coefficient was used to determine the correlation strength between the variables (normal data). The strength of the positive correlations was defined according to the value of the "Correlation Coefficient," as follows: 1: perfect; 0.7 to 0.9: strong; 0.4 to 0.6: moderate; 0.1 to 0.3: weak; and 0: no correlation. The statistical significance was accepted by 2-tailed $P < 0.05$.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

Of the 848 participants, 312 were female (36.8%) and 536 were male (63.2%). The mean age was 66.06+- 8.09 years.

The mean cataract score of the right eyes was 3.42+-1.36. The mean cataract score of the left eyes was 3.38+-1.34. There was a significant correlation between right and left cataract scores (p=0.000, r= 0.765). The mean osteoarthritis stage of the right knees was 3.41+-56. The mean osteoarthritis stage of the left knees was 3.41+-58. There was a significant correlation between the right and left knee osteoarthritis stages (p=0.000, r= 0.979).

A significant positive correlation was found between the cataract score of the right eyes and the stage of the right knees (p=0.000, r= 0.153). A significant positive correlation was found between the cataract score of the left eyes and the stage of the left knees (p=0.000, r= 0.238). A significant positive correlation was found between the mean cataract score and the mean osteoarthritis stage (p=0.000, r= 0.213).

A significant positive correlation was found between the

Table 1. Correlation results of the cataract score, osteoarthritis stage and BAQ score.

	Right LOCS III-NO score	Left LOCS III-NO score	Mean LOCS III-NO score	Right knee osteoarthritis stage	Left knee osteoarthritis stage	Mean osteoarthritis stage	BAQ score
Right LOCS III-NO score	-	p=0.000 r=0.765	-	p=0.000 r=0.153	-	-	p=0.000 r= -0.881
Left LOCS III-NO score	p=0.000 r=0.765	-	-	-	p=0.000 r=0.238	-	p=0.000 r= -0.799
Mean LOCS III-NO score	-	-	-	-	-	p=0.000 r=0.213	p=0.000 r= -0.891
Right knee osteoarthritis stage	p=0.000 r=0.153	-	-	-	p=0.000 r=0.979	-	p=0.000 r= -0.189
Left knee osteoarthritis stage	-	p=0.000 r=0.238	-	p=0.000 r=0.979	-	-	p=0.000 r= -0.182
Mean osteoarthritis stage	-	-	p=0.000 r=0.213	-	-		p=0.000 r= -0.186

LOCS III-NO: Lens Opacities Classification System III- Nuclear Opacity, BAQ: Body Awareness Questionnaire

cataract score of the right eyes and the patients' BWQ score (p=0.000, r= -0.881). A significant positive correlation was found between the cataract score of the left eyes and the patients' BWQ score (p=0.000, r: -0.799). A significant positive correlation was found between the mean cataract score and the patients' BWQ score (p=0.000, r: -0.891).

A significant positive correlation was found between the stage of the right knees osteoarthritis and the BWQ score of the patients (p=0.000, r: -0.189). A significant positive correlation was found between the stage of the left knees and the BWQ score of the patients (p=0.000, r: -0.182). A significantly positive correlation was found between the mean knee stage and the patients' BWQ score (p=0.000, r: -0.186).

Discussion

Our study investigated the correlation between knee osteoarthritis and cataract stages and the body awareness of these patients. Age is an important factor in the pathogenesis of cataracts and osteoarthritis. A significant positive correlation was found between cataract scores and osteoarthritis stages due to a common etiology. However, this correlation was found to be weak. On the other hand, a negative correlation was found between the patients' cataract scores and osteoarthritis stages and their body awareness. However, it was also found that the stage of cataract was approximately 5 times more correlated with body awareness than the stage of osteoarthritis.

Senile cataract, known as age-related cataract, affects approximately 17% of the population and causes vision loss and economic burdens [9]. It is commonly seen equally in both sexes over the age of 50 [10]. It is usually bilateral, but often one eye is affected earlier than the other [10]. In our study, a positive correlation was found between the cataract scores of both eyes with a strong coefficient of 0.7. Knee osteoarthritis is a common joint disease that causes significant morbidity. Osteoarthritis may have an asymmetrical onset but may affect both joints over time [11]. Accordingly, in our study, it was observed that the stages of the right and left knees were significantly correlated with each other and had a very strong correlation rate (r:0.9). Accordingly, it can be thought that knee osteoarthritis has a more symmetrical involvement than cataracts.

Since cataracts and osteoarthritis are accepted as diseases of old age, the correlation between the stages of the diseases is an expected result. However, this correlation was found to have a weak coefficient. This weak correlation may be due to the fact that diseases have very different etiologies apart from the age. To the best of our knowledge, there is no study in the literature with which we can compare our results, and there are limited studies examining the coexistence of osteoarthritis and cataracts. A study conducted in women over 50 years of age in Brazil reported osteoarthritis in 33% of women and cataract in 24% [12]. Alawneh et al. reported that the prevalence of cataracts did not increase in patients with osteoarthritis [13].

The rapid increase in the geriatric population is a worldwide condition. Aging accelerates the deterioration of physiological and psychological health, leading to increased morbidity and mortality [14]. Delays in diagnosis and treatment of diseases that occur with age can lead to disability and poor quality of life. Recently, the prevalence of osteoarthritis and cataracts has been increasing rapidly due to the aging population. However, there are no studies on body awareness of these patients. In our study, a significant and negative correlation was found between the scores of the cataract patients and their BAQ scores, and this correlation was at a strong coefficient. A weak, negative correlation was found between the stages of osteoarthritis patients and their BAQ scores. The decrease in visual acuity in cataract patients is insidious, and patients may fail to notice vision loss for a while [15]. Binocular vision is high, especially in patients with asymmetrical involvement, so they may not notice advanced cataracts. Therefore, recognizing cataracts in early stages may require high body awareness. In contrast to cataracts, osteoarthritis has more noticeable symptoms clinically, such as pain and limited range of motion. The pain and limitation accompanying osteoarthritis and the resulting decrease in physical functions may compel the patient to go to the health institution even if their body awareness is low. A weak correlation with the BAQ score in osteoarthritis patients may be due to these reasons.

Our study is important as it is the first study to compare the osteoarthritis and cataract stages of patients with a high number of participants and to investigate their body awareness.

Conclusion

In conclusion, there is a significant correlation between the patients' cataract scores and osteoarthritis stages, but this correlation is not strong. Cataract progression was found to be more asymmetrical than osteoarthritis. It was also found that cataract patients should have a higher body awareness to notice early-stage cataracts compared to early-stage osteoarthritis. The diseases identified in this study have the potential to cause significant clinical and economic consequences when inadequately treated. Therefore, geriatric screening programs can provide a chance for treatment before diseases progress and more extensive and costly interventions can be prevented.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Conflict of interest

The authors declare no conflict of interest.

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